REMARKS

The Office Action of March 26, 2004 presents the examination of claims 1-16. The present paper cancels claims 1-16, and adds claims 17-36 directed to the same subject matter. This method of amendment was chosen for its simplicity.

Information Disclosure Statement - form PTO-1449

The Examiner has not provided Applicants with an initialed copy of the PTO-1449 form filed with the Information Disclosure Statement filed February 15, 2002. An initialed copy thereof is respectfully requested from the Examiner with the next Office communication.

Objections to the specification and abstract

The Examiner has objected to the specification for lack of inclusion of certain headings and to the abstract as to its form generally. The specification is amended herein and a substitute abstract accompanies this paper. Applicants believe that these items fully address the objections raised by the Examiner.

Rejection under 35 USC § 101

Claim 13 is rejected under 35 USC § 101 as being a non-statutory "use" claim. Claim 13 is canceled, rendering this

rejection moot. New claims 17-36 are written as proper method and product claims.

Rejections under 35 USC § 112, second paragraph

Claims 1-16 are rejected under 35 USC § 112, second paragraph, as being indefinite. The Examiner cites instances of lack of antecedent basis, the presentation of a "use" claim, and improper multiple dependencies. Claims 1-16 are canceled, rendering this rejection moot. Applicants submit that the new claims 17-36 are free of the defects that prompted the instant rejection.

The amendments to the claims are made merely to address the formal matters of lack of antecedent basis and the like and are not narrowing amendments.

Rejections under 35 USC § 103(a) 103(a)

Claims 1-6 and 14-16 stand rejected under 35 USC § 103(a) as being unpatentable over Panzera '412 or Andersson '472. This rejection is respectfully traversed. Reconsideration and withdrawal thereof are requested. In view of the alternative form of the citation of the references, Applicants' Representative addresses each in turn.

Applicants submit that the Examiner fails to establish *prima facie* obviousness over Panzera '412. The Examiner admits that the reference fails to disclose that a presintered material should have

a raw breaking resistance of from 15 to 28 MPa. The Examiner takes a position that the strength of the presintered material is a "result effective variable" and therefore optimization of this parameter is obvious.

Applicants disagree. First, the Examiner fails to establish what process parameters provide a presintered material having a breaking strength in the recited range of 15-28 MPa. Panzera '412 teaches to provide soft-sintered blocks which have bisque densities between about 50% and about 85% of the theoretical density. Paragraph [0017] teaches to use a pressure of 50,000 psi and then soft-sinter the obtained green blocks in a temperature range from about 1225°C to about 1350°C such that the obtained bisque density is less than 85%, preferably less than 75% of the theoretical density of the block.

If a person skilled in the art would follow this teaching in an experiment using a pressure of about 50,000 psi and heating the obtained green block at a temperature of about 1300°C such that the obtained density is about 65% of the theoretical end density it would be very unlikely that a raw breaking resistance of 15 to 28 MPa is obtained. The raw breaking resistance depends upon at least one additional variable, the pre-sintering time, and Panzera '412 does not disclose any specific pre-sinter times. A value of between 15 and 28 MPa would be obtained by the process disclosed by Panzera '412 only by chance.

The Examiner states that the raw breaking strength of a pre-sintered material is recognized as a "result effective parameter" because, "Panzera does disclose that the presintered material should be less strong than a fully sintered ceramic (to avoid abrading the milling tools - see paragraph 008) but stronger than a green body (so that it can be properly machined -[001])." However, Panzera '412 describes the "bisque density" of the material as the "result effective variable" that is adjusted to achieve the advantage stated (*i.e.* milling without abrading the tool). Panzer '412 does not suggest that the raw breaking strength is the relevant variable. The raw breaking resistance relates to the bending strength and the distortion of the pre-sintered ceramic and not with the bisque density as disclosed by Panzera '412.

Neither is the present invention *prima facie* obvious in view of Andersson '472. The Examiner admits that Andersson '472 does not disclose or suggest the range of raw breaking strength of the pre-sintered material obtained by Andersson.

Furthermore, the object of the Andersson '472 invention is concerned with forming a ceramic article over or within a mold using a compressive force. There is a step of machining of a pre-sintered item, but that is mentioned without regard to any issue of tool wear.

Therefore, the motivation to make the present invention, *i.e.* avoiding the wearing of tools by choosing to mill an item

intermediately processed to a particular result, is absent from the Andersson reference.

As is the case for the Panzera '412 reference, there is no suggestion of raw breaking strength as any variable worthy of consideration in the pre-sintering step. Still furher, in the paragraph bridging column 1 and 2 of Andersson '472 it is recommended to use a compressive force of about 2000 MPa and then pre-sintering the obtained green bodies at a temperature of 800-1300°C. There are no instructions which specific temperature and which specific pre-sintering time should be used. As in Panzera '412, there is no disclosure or suggestion of the process that provides a ceramic material having a raw breaking strength of from 15 to 28 MPa.

Thus, Andersson '472 fails to establish *prima facie* obviousness of the claimed invention for the same reasons Panzera '412 fails, lack of disclosure of that raw breaking strength is worthy of attention in the intermediate article, and selection of the range of raw breaking strength recited in the claims.

For all of the reasons set forth above, the rejection of claims 1-6 and 14-16 as being obvious over Panzera '412 or Andersson '472 should be withdrawn.

Claims 7-12 stand rejected under 35 USC § 103(a) as being unpatentable over Church '096 in view of Tsunekawa '667. This

rejection is respectfully traversed. Reconsideration and withdrawal thereof are requested.

Church '096 discloses a method to produce a chemically hardened refractory body by impregnating the porous green body with a solution of an inorganic chromium compound and other components and to heat the body several times to a temperature below the vitrification temperature. The paragraph bridging columns 8 and 9 for example teaches to heat cure a phosphoric acid impregnated ceramic wherein the heating cycle is usually started around 150°F and ends at about 900°F. Most of the range represents temperatures below the temperatures needed for pre-sintering the green bodies in order to obtain a raw breaking resistance from 15 to 28 MPa. To the degree the reference describes use of a temperature below 850°C, it teaches away from the present invention as such represents a suggestion to use a temperature inadequate to obtain a raw breaking strength of from 15 to 30 Mpa. There is also no disclosure of the time-temperature combination required to achieve this range of raw breaking resistance. Thus, there is no disclosure or suggestion in Church '096 of the processing parameters required to obtain a material having the range of raw breaking strength recited in the claims.

Tsunekawa '667 provides no remedy to the defects of Church '096 in disclosing or suggesting the invention. The Examienr cites Tsunekawa '667 for disclosure of the ingredients of the composition

of the ceramics. Thus, the combination of Tsunekawa '667 with Church '096 still fails to disclose or suggest that a ceramic material should have a raw breaking strength of from 15 to 30 MPa as set forth in claims 7-12 (now claims 23-33).

From the above, it is clear that the combination of Church '096 with Tsunedawa '667 fails to establish *prima facie* obviousness of the presently claimed invention. Accordingly, the rejection of claims 7-12 under 35 USC § 103(a) over these references should be withdrawn.

The present application well-describes and claims patentable subject matter. The favorable action of allowance of the pending claims and passage of the application to issue is respectfully requested.

Pursuant to the provisions of 37 C.F.R. §§ 1.17 and 1.136(a), Applicants respectfully petition for a three (3) month extension of time for filing a response in connection with the present application. The required fee of $950.00 is attached hereto.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Mark J. Nuell (Reg. No. 36,623) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment(s): Abstract of the Disclosure

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